

**REMARKS**

This Reply is responsive to the Office Action dated June 3, 2003. Entry of the amendments and remarks submitted herein and reconsideration of the claimed subject matter pursuant to 37 CFR §1.116 is respectfully requested.

**I. Status of the Claims**

Claims 1-14 were pending in this application at the time of the Office Action dated June 3, 2003. Claims 8 and 10-13 were withdrawn from consideration. Accordingly, claims 1-7, 9 and 14 are now under examination.

**II. Amendments to the Claims**

The claims have been amended above to delete reference to functional equivalents. Also, claim 1 was amended to clarify that the claimed fragments are also devoid of light chains. No prohibited new matter has been added by way of these amendments.

**III. Rejections Under 35 U.S.C. §112**

Claims 1-6 and 9 remain rejected under 35 U.S.C. §112, second paragraph, for including reference to “functional equivalents.” Without necessarily agreeing with the rejection, Applicants note that the claims have been amended above to delete reference to functional equivalents. Accordingly, this rejection may now be withdrawn.

Claim 1 was also rejected because it is allegedly unclear whether the phrase “devoid of a variable light chain domain” is also meant to apply to the recited active

fragments. Applicants note that claim 1 has been amended above to clarify that the claimed fragments are also devoid of light chains. Accordingly, this rejection may now be withdrawn.

The Office Action also questions how an antibody devoid of light chains would be capable of binding an antigen, since antibodies are generally understood to require both heavy and light chain variable regions to form a specific antigen binding site. Applicants respectfully note that heavy chain antibodies that are devoid of light chains are known to exist naturally, *e.g.*, such as those expressed by camelidae. Their amino acid sequence and structure is such that the heavy chain forms a binding pocket that can bind a ligand. Such antibodies are described in the Casterman reference, which is already of record (WO 94/04678). Reconsideration and withdrawal of the rejection are respectfully requested.

#### **IV. Prior Art Rejections**

Claims 1, 3, 4, 7 and 9 remain rejected, as well as claim 14, under 35 U.S.C. §102(b) as being allegedly anticipated by Owen *et al.* or Le Gall *et al.* Claims 1, 3 and 6-7 remain rejected, and claim 14 is rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Artsaenko *et al.* Claims 1 and 2 remain rejected, and claim 14 is rejected, under 35 U.S.C. §102(b) as being allegedly anticipated by Casterman *et al.* Applicants respectfully maintain their traverse these prior art rejections.

At the outset, Applicants note that the claims have been amended above to delete reference to functional equivalents. This should resolve the rejections based on Owen *et al.*, Le Gall *et al.* and Artsaenko *et al.*, since the basis for retaining these rejections was

that single chain antibodies are functional equivalents of the claimed heavy chain immunoglobulins.

The §102(b) rejection of claims 1, 2 and 14 in view of Casterman *et al.* is based on the general reference in Casterman to Hiatt *et al.* as disclosing specific promoters and signal peptides for expression in plants. Applicants again respectfully stress that a mere reference to another article that teaches bits and pieces of items required to practice the claimed invention does not translate to an enabling disclosure for the cited reference. Indeed, according to MPEP 2131.01, extra references may be relied upon to show a primary reference contains an “enabled disclosure” when the claimed composition or machine is disclosed *identically* by the reference. *In re Samour*, 571 F.2d 559 (CCPA 1978), and *In re Donahue*, 766 F.2d 531 (Fed. Cir. 1985) (with emphasis).

In response, the Office Action states that the Casterman *et al.* reference is enabled “because it had been established that one skilled in the art *could* express antibodies in plants at the time of Applicants’ invention.” Applicants respectfully submit that a reference that merely postulates that something *could* be done does not *identically* disclose the invention. Again, according to MPEP 2121.02, such a reference is only presumed operable until applicant provides facts rebutting the presumption of operability. *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980). If Applicant is able to show that attempts at performing the invention were unsuccessful before the date of invention, then a reference that merely suggests that something could be done does not contain an enabling disclosure.

Applicants respectfully submit that there would have been no reason for the skilled person to express the immunoglobulins of Casterman *et al.* in plants based solely

on the reference to Hiatt *et al.*, because there was no reasonable expectation of success in view of the difficulties demonstrated in the prior art. Indeed, in view of the disclosures of Ma *et al.* in Science and the Vu PhD thesis (both of record), the expression of heavy chain immunoglobulins in plants is not straightforward. Applicants were the first to accomplish expression of these specific molecules in plants and to identify the retained binding activity and possibility of targeted expression.

Accordingly, Applicants respectfully submit that Casterman *et al.* is not an enabling reference by the mere inclusion of a reference to Hiatt *et al.*, and therefore cannot be relied upon as a §102(b) reference.

Based on the above remarks, Applicants respectfully submit that the cited documents do not anticipate or render obvious the claims as amended. Accordingly, reconsideration and withdrawal of all the rejections under §102 are respectfully requested.


Applicants note with appreciation the withdrawal of the rejection under 35 U.S.C. §103.

This reply is fully responsive to the Office Action dated June 3, 2003. Therefore, a Notice of Allowance is next in order and is respectfully requested.

Except for issue fees payable under 37 CFR §1.18, the commissioner is hereby authorized by this paper to charge any additional fees during the pendency of this application including fees due under 37 CFR §1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 CFR §1.136(a)(3).

If the Examiner has any further questions relating to this Reply or to the application in general, she is respectfully requested to contact the undersigned by telephone so that allowance of the present application may be expedited.

Respectfully submitted  
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